AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. through 72. (cancelled).

73. (currently amended): An optical waveguide for outputting light of a substantially single predetermined wavelength, the optical waveguide comprising:

a light conducting medium (2) defining a longitudinally extending optical path (15) for guiding the light, the optical path (15) extending longitudinally between respective spaced apart first and second ends (8,9), and

a means (20,21) for causing partial longitudinal reflections of the light along the optical path (15) at at least two spaced apart partial reflecting locations (20) along the optical path (15) for deriving light of the predetermined wavelength, wherein the means (20,21) for causing the partial reflections comprises a refractive index altering means (21) for altering the effective refractive index of the light conducting medium (2) presented to light passing along the optical path (15) at each of the at least two reflecting locations (20) for causing the partial reflections, and the means for causing the partial reflections locates the reflecting locations (20) along the optical path (15) at distances from the first end (8) along the optical path (15) which are functions of the ~~effective optical length of the optical path (15) taking~~ product of the actual

length of the optical path (15) and the actual refractive index of the light conducting medium (2) defining the optical path, less the sum of the products of the lengths of the reflecting locations (20) and the differences between respective effective refractive indices of the reflecting locations (20) and the actual refractive index of the light conducting medium defining the optical path (15), so that account is taken of alteration to the actual length of the optical path (15) resulting from the effect of the ~~means (20,21) for causing the partial reflections~~ alteration of the effective refractive index at the respective reflecting locations on the actual length of the optical path (15), so that the distances of the reflecting locations along the optical path from the first end are such that the standing waves set up between the first end and each of the reflecting locations, and the standing wave or waves set up between any two of the reflecting locations, and the standing wave set up between the first and second ends, are all in harmonic relationship with each other.

74. (cancelled).

75. (currently amended): An optical waveguide as claimed in Claim ~~74~~ 73 wherein the length of each reflecting location (20) in the longitudinal direction of the optical path (15) is in the range of 0.3 microns to 200 microns.

76. (previously presented): An optical waveguide as claimed in Claim 75 wherein the respective lengths of the reflecting locations (20) along the optical path are the same and the effective refractive indices of the respective reflecting locations (20) are the same.

77. (cancelled).

78. (currently amended): An optical waveguide as claimed in Claim ~~74~~ 73 wherein the distance of the p^{th} reflecting location (20) from the first end (8) along the optical path (15) is provided by the formula:

$$L = \frac{X\left\{L_{device}n_{device} - \sum_{i} l_i \Delta n_i\right\} + \sum_{i=1}^{p-1} l_i \Delta n_i + \frac{1}{2} l_p \Delta n_p}{n_{device}}$$

where: L is the distance of the p^{th} reflecting location from the first end along the optical path,

X is the fraction of the actual optical length at which the element is to be placed,

L_{device} is the actual length of the optical path,

n_{device} is the average refractive index of the light conducting layers of the unperturbed light conducting medium of the optical path presented to the light,

l_i is the length of the i^{th} reflecting location in the direction of the optical path,

Δn_i is the difference between the effective refractive index of the i^{th} partial reflecting location and the average refractive index of the unperturbed optical path,

l_p is the length of the p^{th} reflecting location in the direction of the optical path, and

Δn_p is the difference between the effective refractive index of the p^{th} partial reflecting location and the average refractive index of the optical path.

79. (currently amended): An optical waveguide as claimed in Claim ~~74~~ 73 wherein the refractive index altering means (21) comprises a plurality of refractive index altering elements (20) one refractive index altering element being provided for each reflecting location, the respective refractive index altering elements being located at distances from the first end along the optical path similar to the distances from the first end of the corresponding reflecting location.

80. (previously presented): An optical waveguide as claimed in Claim 79 wherein each refractive index altering element (21) is provided by a refractive index altering groove (21) formed in a medium adjacent the light conducting medium but spaced apart therefrom.

81. (currently amended): An optical waveguide as claimed in Claim ~~74~~ 73 wherein the respective reflecting locations (20) are formed by a dopant.

82. (previously presented): An optical waveguide as claimed in Claim 73 wherein the optical waveguide is a waveguide for laser light.

83. (previously presented): An optical waveguide as claimed in Claim 82 wherein a ridge (14) is formed on a surface of the semiconductor laser waveguide for defining the optical path through the light conducting medium, and the refractive index altering elements (21) are located in the ridge (14) at locations corresponding to the reflecting location.

84. (cancelled).

85. (cancelled).

86. (previously presented): An optical waveguide as claimed in Claim 73 wherein the means (20,21) for causing the partial reflections causes the partial reflections at at least three reflecting locations (20) along the optical path (15).

87. (currently amended): An optical waveguide as claimed in Claim ~~86~~ 73 wherein the reflecting locations (20) are provided at respective distances from the first end which correspond to the following fractions of the actual length of the optical path, namely, 1/16, 1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8 and 3/4 along the optical path.

88. (previously presented): An optical waveguide as claimed in Claim 73 comprising a plurality of optical waveguides provided in the form of an array (50).

89. (previously presented): An array of optical waveguides wherein the respective optical waveguides of the array are optical waveguides as claimed in Claim 73.

90. (currently amended): A method for providing an optical waveguide for outputting light of a substantially single predetermined wavelength, the method comprising:

providing a light conducting medium (2) defining a longitudinally extending optical path (15) for guiding the light, the optical path (15) extending longitudinally between respective spaced apart first and second ends (8,9), and

providing a means (20,21) for causing partial longitudinal reflections of the light along the optical path (15) at at least two spaced apart partial reflecting locations (20) along the optical path for deriving the light of the predetermined wavelength, wherein the means (20,21) for causing the partial reflections ~~are provided such that~~ comprises a refractive index altering means (21) for altering the effective refractive index of the light conducting medium (2) presented to light passing along the optical path (15) at each of the at least two reflecting locations (20) for causing the partial reflections, and the means for causing the partial reflections locates the reflecting locations (20) ~~are~~ along the optical path at distances from the first end (8) along the optical path (15), ~~which are functions of the effective optical length of the optical path (15) taking~~ so that account is taken of alteration to the actual length of the optical path (15) resulting from the effect of the ~~means (20,21) for causing the partial reflections~~ alteration of the effective refractive index at the respective reflecting locations on the actual length of the optical path (15), so that the distances of the reflecting locations along the optical path from the first end are such that the standing waves set up between the first end and each of the reflecting locations, and the standing wave or waves set up between any two of the reflecting locations, and the standing wave set up between the first and second ends, are all in harmonic relationship with each

other[[.]], and the distance of the p^{th} reflecting location (20) from the first end (8) along the optical path (15) is provided by the formula:

$$L = \frac{X\left\{L_{device} n_{device} - \sum_{i} l_i \Delta n_i\right\} + \sum_{i=1}^{p-1} l_i \Delta n_i + \tfrac{1}{2} l_p \Delta n_p}{n_{device}}$$

where: L is the distance of the p^{th} reflecting location from the first end along the optical path,

X is the fraction of the actual optical length at which the element is to be placed,

L_{device} is the actual length of the optical path,

n_{device} is the average refractive index of the light conducting layers of the unperturbed light conducting medium of the optical path presented to the light,

l_i is the length of the i^{th} reflecting location in the direction of the optical path,

Δn_i is the difference between the effective refractive index of the i^{th} partial reflecting location and the average refractive index of the optical path,

l_p is the length of the p^{th} reflecting location in the direction of the optical path, and

Δn_p is the difference between the effective refractive index of the p^{th} partial reflecting location and the average refractive index of the unperturbed optical path.

91. (cancelled).

92. (currently amended): A method as claimed in Claim ~~91~~ 90 wherein the length of each reflecting location (20) in the longitudinal direction of the optical path (15) is in the range of 0.3 microns to 200 microns.

93. (currently amended): A method as claimed in Claim ~~91~~ 90 wherein the respective lengths of the partial reflecting locations along the optical path are the same and the effective refractive indices of the respective reflecting locations are the same.

94. (cancelled).

95. (previously presented): An optical waveguide as claimed in Claim 75 wherein the respective lengths of the reflecting locations along the optical path are different, and the effective refractive indices of the respective reflecting locations are different.

96. (previously presented): An optical waveguide as claimed in Claim 80 wherein the depth of the refractive index altering grooves is the same.

97. (previously presented): An optical waveguide as claimed in Claim 80 wherein the depth of the refractive index altering grooves is different.

98. (previously presented): An optical waveguide as claimed in Claim 79 wherein each refractive index altering element extends substantially transversely relative to the optical path.

99. (previously presented): An optical waveguide as claimed in Claim 73 wherein the distance from the first end along the optical path to each reflecting location is measured to the centre of the reflecting location.

100. (previously presented): An optical waveguide as claimed in Claim 73 wherein the optical waveguide is a passive semiconductor waveguide.

101. (currently amended): An optical waveguide as claimed in Claim ~~86~~ 73 wherein the reflecting locations are provided at respective distances from the first end which correspond to the following fractions of the actual length of the optical path, namely, 1/14, 1/7, 3/14, 2/7, 3/7, 4/7 and 5/7 along the optical path.

102. (currently amended): A method as claimed in Claim ~~91~~ 90 wherein the respective lengths of the partial reflecting locations along the optical path are different, and the effective refractive indices of the respective reflecting locations are different.

103. (new): An optical waveguide for outputting light of a substantially single predetermined wavelength, the optical waveguide comprising:

a light conducting medium (2) defining a longitudinally extending optical path (15) for guiding the light, the optical path (15) extending longitudinally between respective spaced apart first and second ends (8,9), and

a means (20,21) for causing partial longitudinal reflections of the light along the optical path (15) at at least two spaced apart partial reflecting locations (20) along the optical path (15) for deriving light of the predetermined wavelength, wherein the means (20,21) for causing the partial reflections comprises a refractive index altering means (21) for altering the effective refractive index of the light conducting medium (2) presented to light passing along the optical path (15) at each of the at least two reflecting locations (20) for causing the partial reflections, and the means for causing the partial reflections locates the reflecting locations (20) along the optical path (15) at distances from the first end (8) along the optical path (15), so that account is taken of alteration to the actual length of the optical path (15) resulting from the effect of the alteration of the effective refractive index at the respective reflecting locations on the actual length of the optical path (15), so that the distances of the reflecting locations along the optical path from the first end are such that the standing waves set up between the first end and each of the reflecting locations, and the standing wave or waves set up between any two of the reflecting locations, and the standing wave set up between the first and second ends, are all in harmonic relationship with each other, and the distance of the p^{th} reflecting location (20) from the first end (8) along the optical path (15) is provided by the formula:

$$L = \frac{X\left\{L_{device}n_{device} - \sum_{i} l_i \Delta n_i\right\} + \sum_{i=1}^{p-1} l_i \Delta n_i + \frac{1}{2} l_p \Delta n_p}{n_{device}}$$

where: L is the distance of the p^{th} reflecting location from the first end along the optical path,

X is the fraction of the actual optical length at which the element is to be placed,

L_{device} is the actual length of the optical path,

n_{device} is the average refractive index of the light conducting layers of the unperturbed light conducting medium of the optical path presented to the light,

l_i is the length of the i^{th} reflecting location in the direction of the optical path,

Δn_I is the difference between the effective refractive index of the i^{th} partial reflecting location and the average refractive index of the unperturbed optical path,

l_p is the length of the p^{th} reflecting location in the direction of the optical path, and

Δn_p is the difference between the effective refractive index of the p^{th} partial reflecting location and the average refractive index of the optical path.

104. (new): An optical waveguide for outputting light of a substantially single predetermined wavelength, the optical waveguide comprising:

a light conducting medium (2) defining a longitudinally extending optical path (15) for guiding the light, the optical path (15) extending longitudinally between respective spaced apart first and second ends (8,9), and

a means (20,21) for causing partial longitudinal reflections of the light along the optical

path (15) at a plurality of spaced apart partial reflecting locations (20) along the optical path (15) for deriving light of the predetermined wavelength, wherein the means (20,21) for causing the partial reflections locates the reflecting locations (20) along the optical path (15) at distances from the first end (8) along the optical path (15) which correspond to the following fractions of the actual length of the optical path, namely, 1/16, 1/8, 3/16, 1/4, 5/16, 3/8, 1/2, 5/8 and 3/4, so that account is taken of alteration to the actual length of the optical path (15) resulting from the effect of the means (20,21) for causing the partial reflections on the actual length of the optical path (15), and so that the standing waves set up between the first end and each of the reflecting locations, and the standing wave or waves set up between any two of the reflecting locations, and the standing wave set up between the first and second ends, are all in harmonic relationship with each other.

105. (new): An optical waveguide for outputting light of a substantially single predetermined wavelength, the optical waveguide comprising:

a light conducting medium (2) defining a longitudinally extending optical path (15) for guiding the light, the optical path (15) extending longitudinally between respective spaced apart first and second ends (8,9), and

a means (20,21) for causing partial longitudinal reflections of the light along the optical path (15) at a plurality of spaced apart partial reflecting locations (20) along the optical path (15) for deriving light of the predetermined wavelength, wherein the means (20,21) for causing the partial reflections locates the reflecting locations (20) along the optical path (15) at distances

from the first end (8) along the optical path (15) which correspond to the following fractions of the actual length of the optical path, namely, 1/14, 1/7, 3/14, 2/7, 3/7, 4/7 and 5/7, so that account is taken of alteration to the actual length of the optical path (15) resulting from the effect of the means (20,21) for causing the partial reflections on the actual length of the optical path (15), and so that the standing waves set up between the first end and each of the reflecting locations, and the standing wave or waves set up between any two of the reflecting locations, and the standing wave set up between the first and second ends, are all in harmonic relationship with each other.

106. (new): A method for providing an optical waveguide for outputting light of a substantially single predetermined wavelength, the method comprising:

providing a light conducting medium (2) defining a longitudinally extending optical path (15) for guiding the light, the optical path (15) extending longitudinally between respective spaced apart first and second ends (8,9), and

providing a means (20,21) for causing partial longitudinal reflections of the light along the optical path (15) at at least two spaced apart partial reflecting locations (20) along the optical path for deriving the light of the predetermined wavelength, wherein the means (20,21) for causing the partial reflections comprises a refractive index altering means (21) for altering the effective refractive index of the light conducting medium (2) presented to light passing along the optical path (15) at each of the at least two reflecting locations (20) for causing the partial reflections, and the means for causing the partial reflections locates the reflecting locations (20) along the optical path at distances from the first end (8) along the optical path (15) which are

functions of the product of the actual length of the optical path (15) and the actual refractive index of the light conducting medium (2) defining the optical path, less the sum of the products of the lengths of the reflecting locations (20) and the differences between respective effective refractive indices of the reflecting locations (20) and the actual refractive index of the light conducting medium defining the optical path (15), so that account is taken of alteration to the actual length of the optical path (15) resulting from the effect of the alteration of the effective refractive index at the respective reflecting locations on the actual length of the optical path (15), so that the distances of the reflecting locations along the optical path from the first end are such that the standing waves set up between the first end and each of the reflecting locations, and the standing wave or waves set up between any two of the reflecting locations, and the standing wave set up between the first and second ends, are all in harmonic relationship with each other.